Point-E: A System for Generating 3D Point Clouds from Complex Prompts

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Abstract

While recent work on text-conditional 3D object generation has shown promising results, the state-of-the-art methods typically require multiple GPU-hours to produce a single sample. This is in stark contrast to state-of-the-art generative image models, which produce samples in a number of seconds or minutes. In this paper, we explore an alternative method for 3D object generation which produces 3D models in only 1-2 minutes on a single GPU. Our method first generates a single synthetic view using a text-to-image diffusion model, and then produces a 3D point cloud using a second diffusion model which conditions on the generated image. While our method still falls short of the state-of-the-art in terms of sample quality, it is one to two orders of magnitude faster to sample from, offering a practical trade-off for some use cases. We release our pre-trained point cloud diffusion models, as well as evaluation code and models, at https://github.com/openai/point-e.